

What is claimed is:

1. A system for enabling efficient utilization of available bandwidth through overlapping adjacent channels comprising:
 - a receiver for receiving a waveform having data information
 - 5 and noise information,
 - a filter bank adapted to receive and filter said waveform and output channel information, said channel information including a combination of data signals and adjacent channel interference signals, said filter bank further adapted to provide estimated data signals and to
 - 10 calculate estimated interference signals; and
 - one or more interference generating processors adapted to receive said calculated estimated interference signals to enable said interference generating processor to generate interference signals corresponding to said calculated estimated interference signals, said
 - 15 interference generating processor further adapted to subtract said interference signals from said estimated data signals and to output subsequent relatively more accurate estimated data signals.
2. The system of claim 1, wherein said channel information includes interfering signals from different users using the
- 20 same channel, said interference generating processors being adapted to receive and calculate estimated interference from the different users of the same channel to enable said interference generating processor to generate interfering signals corresponding to the interfering users.
3. The system of claim 1, comprising a decision device
- 25 operable with said interference generating processors for estimating data signals in accordance with the relative ability of the information processors to cancel interference with the estimated interference signals.

4. The system of claim 3, wherein said decision device comprises a multi-level decision device comprising a one-sided length zone of the decision device such that no decision is made in a region where the decision variable is of diminished reliability.

5 5. The system of claim 1, comprising one or more interference estimating processors adapted to receive said relatively more accurate estimated data signals and to calculate subsequent estimated interference signals for input into said one or more interference generating processors.

10 6. The system of claim 5, wherein said relatively more accurate estimated data signals are fed back into said one or more interference generating processors for a predetermined number of iterations.

7. A method for enabling efficient utilization of available
15 bandwidth through overlapping adjacent channels comprising:
receiving a waveform having data information and noise information;
filtering the waveform and outputting channel information through a filter bank;
20 producing estimated data signals corresponding to said channel information;
calculating estimated interference signals corresponding to said channel information; and
subtracting said estimated interference signals from said
25 estimated data signals to provide relatively more accurate data signals.

8. The method of claim 7, further including the step of calculating subsequent estimated interference signals from said relatively more accurate data signals.

5 9. The method of claim 8, further including the step of feeding back said relatively more accurate data signals into said subtracting step a predetermined number of times.

10 10. The method of claim 8, further including the step of repeating said feed back step to output increasingly accurate estimated data signals.

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11. A system for enabling efficient utilization of available bandwidth through overlapping adjacent channels comprising:

means for receiving a waveform having data information and noise information;

15 means for filtering the waveform and outputting channel information through a filter bank;

means for producing estimated data signals corresponding to said channel information;

20 means for calculating estimated interference signals corresponding to said channel information; and

means for subtracting said estimated interference signals from said estimated data signals to provide relatively more accurate data signals.

25 12. The system of claim 11, further including means for calculating subsequent estimated interference signals from said relatively more accurate data signals.

13. The system of claim 12, further including means for feeding back said relatively more accurate data signals into said subtracting step a predetermined number of times.

14. The system of claim 12, further including means for
5 repeating said feed back step to output increasingly accurate estimated data signals.